

MAC2311 Class Number 15534

QUIZ 1

1/17/2019

Name: SOLUTIONS

1. Find the limit:

$$1. \text{ SIMPLIFY: } \lim_{x \rightarrow 3^+} \frac{x+3}{(x+3)(x-3)} = \lim_{x \rightarrow 3^+} \frac{1}{x-3} = \frac{1}{3-3} = \frac{1}{0} \quad \downarrow \text{"NUMBER"} \quad \frac{\quad}{0}$$

2. PICK A NUMBER CLOSE TO 3, TO THE RIGHT OF 3, SAY $x=3.1$

$$\Rightarrow \frac{1}{x-3} = \frac{1}{3.1-3} = \frac{\text{POSITIVE \#}}{\text{POSITIVE \#}} = \text{POSITIVE \#}$$

$\Rightarrow \boxed{+\infty}$

2. Find the limit:

$$\lim_{x \rightarrow 2} \frac{x-2}{x^2-x-2} = \lim_{x \rightarrow 2} \frac{1}{x+1} = \frac{1}{2+1} = \boxed{\frac{1}{3}}$$

3. Find the limit:

$$\lim_{x \rightarrow 4} \frac{-2x+8}{|x-4|} = \lim_{x \rightarrow 4} \frac{-2(x-4)}{|x-4|}$$

1. $\lim_{x \rightarrow 4^+} \frac{-2x+8}{|x-4|}$: SINCE $x \rightarrow 4^+$, $x > 4 \Rightarrow |x-4| = x-4$, so $\lim_{x \rightarrow 4^+} \frac{-2(x-4)}{(x-4)} = -2$

2. $\lim_{x \rightarrow 4^-} \frac{-2(x-4)}{|x-4|}$: SINCE $x \rightarrow 4^-$, $x < 4 \Rightarrow |x-4| = -(x-4)$, so

$$\lim_{x \rightarrow 4^-} \frac{+2(x-4)}{+(x-4)} = 2$$

SINCE $\lim_{x \rightarrow 4^+} \frac{-2x+8}{|x-4|} \neq \lim_{x \rightarrow 4^-} \frac{-2x+8}{|x-4|}$ 1, $\lim_{x \rightarrow 4} \frac{-2x+8}{|x-4|} \boxed{\text{DNE}}$